

REMARKS

The Office Action of August 19, 2008 has been carefully considered.

Objection has been raised to Claims 3, 4, 5, 7, 10 and 11, and Applicants believe that these objections have been obviated by the rewriting of the claims as new Claims 13-40. Applicants point out, however, that the word "ca." means "about," and this is the word which is used in the new claims.

Proper subject matter headings have now been added to the specification, as well as citation of the prior filed PCT application.

Claims 1-12 have been rejected under 35 USC 112, second paragraph, as indefinite on a number of grounds. The phrases objected to have been removed from the claims as rewritten. As regards to Claim 8, this claim is supported by the last paragraph on page 10 of the specification and the diameter refers to the circular cross-section of the paste which is applied to the substrate.

Withdrawal of this rejection is requested.

Claims 1-7 and 12 have been rejected under 35 USC 102(b) over Lee et al, while Claim 9 has been rejected under 35 USC 103(a) over Lee et al in view of Grolemund et al, Claim 10 has been rejected under 35 USC 103(a) over Lee in view of Kleiner and Claim 11 has been rejected under 35 USC 103(a) over Lee et al in view of Kleiner.

Claims 1-12 have now been canceled and rewritten as a new set of Claim 13-40. Claim 1 as filed actually included two embodiments of the invention, which have now been written as two separate independent claims, 13 and 27.

In the first embodiment of the invention recited in new Claim 13, the paste-like substance is applied to a support, and after the applying, the substance is contacted with a medium containing a polar molecule, causing the solvent

contained in the substance to be extracted in an edge region, resulting in a hardening and stabilizing of the substance in the edge region.

In the second embodiment recited in new Claim 27, it is the support which is contacted with the medium containing a polar molecule, with forces of adhesion between the medium and support being greater than forces of adhesion between the substance and the support. The contacting thereby substantially prevents flowing of the substance along the support, as well as detachment of the substance from the support.

Neither of these embodiments is disclosed or suggested by the Lee et al reference. Lee et al is directed to a resistive paste for the formation of an electrically heat generating thick film. This is a film which can be heated very quickly, as disclosed at column 5, line 17, and which is appropriately applied to ceramics as disclosed at column 5, line 51. The problem of shadowing of the substrate on which the film is applied does not occur.

According to the process described by Lee et al in the first complete paragraph in column 5, the thick film layer is formed by coating the paste composition on a suitable substrate using screen printing or dipping, drying the coated substrate at a temperature of about 80 to 120°C for about 5 to 10 minutes, and calcining the dried substrate at 500 to 600°C for 5 to 30 minutes. Lee et al does not disclose or suggest treating either the substrate or the coated paste with material containing a polar medium after the application step.

The paste composition of Lee et al does contain a solvent. According to the Office action, "after the substance is applied to the support, a medium containing a polar molecule is on the support and/or the substance (Col. 4, Ln. 45-51 and 56, wherein the medium is surfactant), through which

the solvent contained in the substance is extracted (Col. 5, Ln. 3-13, wherein the coated substrate, extracts the organic solvent contained in the paste composition)." What has been quoted above with respect to the Office action clearly describes the claimed invention, but does not in any way describe the process of Lee et al. At column 4, lines 45-51 and 56, what Lee et al describes is that in addition to paste components mentioned above, the paste may optionally comprise other additives in order to enhance storage stability, uniformity of film thickness and resolution of the printed pattern. Such additives may include a polymerization stopping agent, a dispersant, a defoaming agent, a plasticizer, a surfactant and a thixotropic agent. While a surfactant may be present in the paste, nowhere in Lee et al is there discussed a method step in which a paste is applied to a substrate, and subsequently, medium containing a surfactant, or any other polar molecule, is applied either to the paste or to the substrate. The method of the claimed invention is thus clearly different from what is described in Lee et al. Moreover, removal of the solvent in the paste is clearly described at column 5, lines 3-13, but this removal takes place by a two-step heating process, and not by application of a substance containing a polar molecule.

The claimed invention solves the problem which is important in the solar cell art, specifically preventing the spreading and shading caused thereby in relation to the support. In accordance with the invention (claim 13), the fine printed conductors are hardenable by application of liquids with polar molecules to freshly applied paste structures, so that the freshly applied paste material is prevented from flowing. This is not disclosed or suggested by the Lee et al reference.

The Grolemund et al reference relates to solvent-free

film forming compositions, coated substrates and methods related thereto. No reference to electrically conducting contacts applied to semiconductor elements can be found in Grolemund et al, and the composition disclosed therein is not meant to produce strip-like or punctiform contacts. The composition disclosed is, rather, to be used as coatings on objects, as disclosed at column 3, line 44, and the composition is not appropriate for use as an electrical contact by a semiconductor element.

Kleiner has been cited to show the specific height to breadth ratio of the invention, but does not otherwise cure the defects of the Lee et al reference.

Kleyer et al has been cited to show application of a paste-like substance on a silicon substrate with a surface layer consisting of silicon oxide or silicon nitride, but does not otherwise cure the defects of the Lee et al reference.

Withdrawal of these rejections is requested.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,



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